

REMARKS / ARGUMENTS

Status of the Claims

Claims 1-7 and 9-19 are pending in the application. Claims 1-7 and 9-19 stand rejected. Applicant has amended claims 1 and 15-19, and cancelled claim 10, leaving claims 1-7, 9, and 11-19 for consideration upon entry of the present Amendment.

Applicant respectfully submits that the rejections under 35 U.S.C. §103(a), have been traversed, that no new matter has been entered through this amendment, and that the application is in condition for allowance.

No New Subject Matter

For the Examiner's reference, support for the attached amendments may be found in at least, for example, the subject specification in paragraph [0023], [0024] (e.g., only operating in a selected region of interest of the lung), and FIG. 5 (identifying a region of interest).

Interview Summary

Applicant thanks the Examiner for his time and effort in conducting an Interview with Applicant's representative (hereinafter Applicant) on May 19, 2008. During the interview the Li and Lindeberg references were discussed in detail, as well as features of claim 1. No agreement was reached.

Claim Rejections - 35 U.S.C. §103(a) (Li and Lindeberg)

Claims 1-7, 11-12, and 14-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,937,776 to Li et al. (hereinafter Li) in view of "Discrete Derivative Approximations with Scale-Space Properties: A Basis for Low-Level Feature Extraction," by Lindeberg (hereinafter Lindeberg). Applicant respectfully traverses this rejection.

Applicant respectfully submits that the obviousness rejection based on Li and Lindeberg is improper as the combination of References fail to teach or suggest each and every element of the instant invention in such a manner as to perform as the claimed invention performs. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). The Examiner must meet the burden of establishing that all elements of the invention are taught or suggested in the prior art. MPEP §2143.03.

It is submitted that Li and Lindeberg, taken alone or in combination, fail to disclose or suggest *inter alia*:

“generating a plurality of differential operators for the selected region of interest, separate from the multi-dimensional dataset, using a discrete approximation of an analytic function”

and

“isolating lung tissue for a pair of lungs, including, ... filtering with a high threshold algorithm ... filling holes with a three-dimensional hole filling algorithm ... filtering with a low threshold algorithm ... splitting and isolating said pair of lungs with a morphology erosion algorithm ... closing and filling airways and vascular structures entering said pair of lungs with a morphology closure algorithm... and ... filling remaining holes with a three-dimensional hole filling algorithm”

as recited in independent claim 1 (emphasis added).

As previously submitted, Li merely discloses classifying nodule candidates in a region of interest and filtering an entire set of image data. Therefore, Li cannot disclose or suggest “isolating a selected region of interest from the multi-dimensional dataset ... generating a plurality of differential operators for the selected region of interest, separate from the multi-dimensional dataset, using a discrete approximation of an analytic function” as recited in independent claim 1 (emphasis added).

Furthermore, it is noted that the Examiner relies on Li as "being reasonably construed as isolating a selected region of interest separate from the multi-dimensional dataset" (see Office Action, page 3). However, the Examiner also writes on page 2 that Li

is segmenting the regions "from the original images". If Li is segmenting regions from the original images, Li cannot be selecting a region of interest separate from the multi-dimensional dataset as asserted by the Examiner (i.e., "from the same images" is not a disclosure or teaching of "separate from" the multi-dimensional dataset). Furthermore, "reasonably construing" a reference is not a disclosure or teaching.

Moreover, the isolation of a region of interest as set forth in example embodiments of the present invention differ from the segmentation as described by Li. For example, as set forth in FIG. 5 of the subject application, selecting a region of interest includes isolating lung tissue for a pair of lungs, splitting and isolating said pair of lungs with a morphology erosion algorithm, and closing and filling airways and vascular structures entering said pair of lungs with a morphology closure algorithm. It is respectfully submitted that Li is completely silent with regards to these steps in isolating a region of interest or even segmentation as asserted by the Examiner.

Even further, it is respectfully submitted that the Examiner merely relies on Lindeberg for disclosure of discrete approximations (see Office Action, page 4), and that Lindeberg does not disclose at least the features outlined above with reference to claim 1

Therefore, because Li and Lindeberg fail to disclose or suggest each and every feature of claim 1, claim 1 is patentable over Li and Lindeberg in any combination.

It is further submitted that each of independent claims 15, 16, 17, 18, and 19 contain somewhat similar features to those argued above with reference to claim 1. Therefore, claims 15, 16, 17, 18, and 19 are likewise patentable over Li and Lindeberg for at least these reasons (it is noted that claims 15, 16, 17, 18, and 19 should be interpreted solely by those limitations set forth therein).

Claims 2-7, 11-12, and 14-21 are patentable at least by virtue of their dependency upon independent claim 1, in addition to the features set forth therein.

In view of the foregoing, Applicant submits that Li and Lindeberg fail to teach or suggest each and every element of the claimed invention and are therefore wholly

inadequate in their teaching of the claimed invention as a whole, and therefore cannot properly be used to establish a *prima facie* case of obviousness.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim Rejections - 35 U.S.C. §103(a) (Li, Lindeberg, and Hu)

Claims 9, 10, and 13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Li and Lindeberg, in further view of “Automatic Lung Segmentation for Accurate Quantitation of Volumetric X-Ray CT Images,” by Hu et al. (hereinafter Hu). Applicant respectfully traverses this rejection.

As argued above, Li and Lindeberg fail to disclose or suggest the features of independent claim 1. Furthermore, Applicant submits that even if Li, Lindeberg, and Hu were combinable (which Applicant does not admit), the resulting combination would still not disclose or suggest the features of claim 1, as Hu fails to cure the deficiencies of Li and Lindeberg discussed above.

Furthermore, Applicant submits that Li, Lindeberg, and Hu are not combinable because Lindeberg and Hu teach away from the asserted combination. For example, as set forth by the Examiner on page 12 of the Office action, Lindeberg teaches reduction of the computation requirements to aid in efficiency. However, Hu requires addition of additional computation steps (see at least page 493, section C in addition to remainder of the Hu reference). Such disclosures are opposite, and therefore the asserted combination is not obvious thus a *prima facie* case of obviousness has not been made.

Therefore, Applicant submits that claim 1 is patentable over Li, Lindeberg, and Hu, and that claims 9, and 13 are patentable at least by virtue of their dependency upon independent claim 1. Claim 10 has been cancelled in this amendment.

Applicant respectfully requests the Examiner withdraw this rejection.

CONCLUSION

In light of the forgoing, Applicant respectfully submits that the pending rejections have been traversed, and respectfully requests that the Examiner reconsider and withdraw these rejections.

If a communication with Applicant's Attorneys would assist in advancing this case to allowance, the Examiner is cordially invited to contact the undersigned so that any such issues may be promptly resolved.

The Commissioner is hereby authorized to charge any additional fees that may be required for this amendment, or credit any overpayment, to Deposit Account No. 07-0845.

In the event that an extension of time is required, or may be required in addition to that requested in a petition for extension of time, the Commissioner is requested to grant a petition for that extension of time that is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to the above-identified Deposit Account.

Respectfully submitted,

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